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Community Outreach

Spot Robot Presentation

Background

- Los Alamos National Laboratory has recently obtained a Spot robot from Boston Dynamics to evaluate its suitability for work in and around laboratory facilities
- Spot is a highly mobile quadruped robot capable of up to 90 minutes of operation
- It can be outfitted with payloads up to 35 lbs. and supports both Boston Dynamics developed equipment, third party payloads, or custom developed payloads
- One existing Boston Dynamics attachment is a robot arm that allows the robot to directly interact with its environment, open doors, turn valves, etc.

Initial Testing Completed

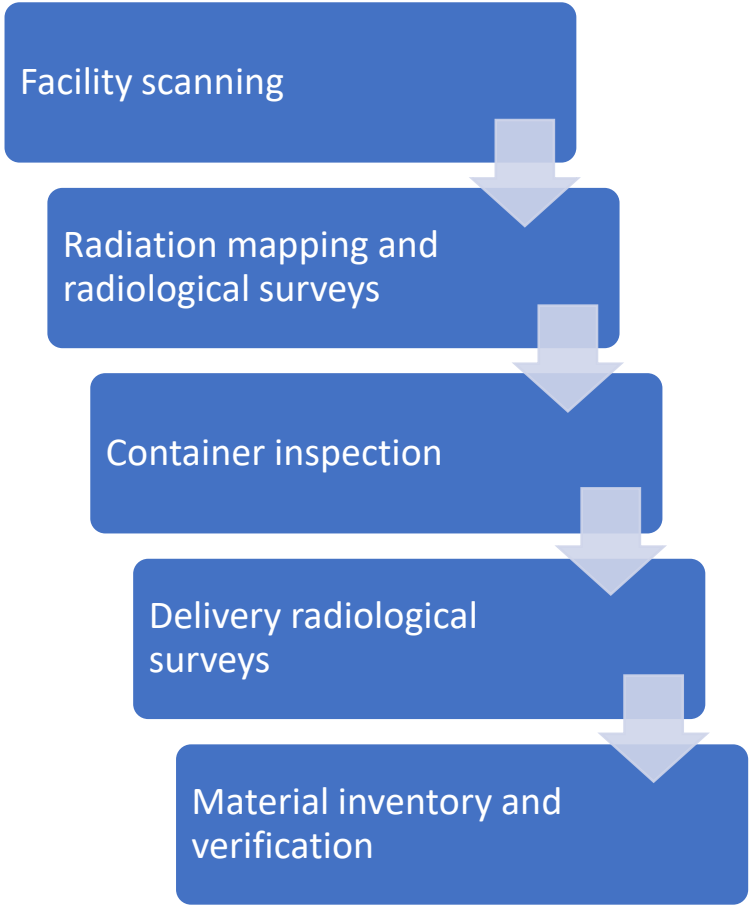
- The first portion of this evaluation was recently completed
- Two Spot robots were tested for a week to determine their ability to operate in a radiation environment using Co60 sources (4 and 12 Currie)
- Both robots successfully operated in ~100 REM/hour with no issues
- No failures occurred with a maximum dose of 413 REM

Initial Testing Results

Initial Testing Results

Development Plan

- Spot is intended to:
  - Augment staff responsibilities including RCT surveys to increase efficiency
  - Provide additional capabilities to decrease risk to facilities and staff
- Los Alamos plans to test the implementation of Spot with a phased approach, starting with tasks that maximize its current capabilities and commercially available equipment
- Over time additional capabilities and custom equipment will be incorporated to expand the Spot's capabilities while leveraging previous work



Facility Mapping

- One of Spot's primary functions in industry is to map facilities using existing payloads
- This data is used to create a digital twin to document facility changes over time
- Initially, Spot's existing payloads and capabilities will be used to set up automated mapping routines that can be executed
- Ultimately, custom software will be developed that will enable Spot to execute facility scans without the need for wireless networks or pre-determined routes.

Radiation Mapping and Radiological Surveys

- Incorporating a custom radiological survey payload will allow Spot to augment Radiological Control Technician work
- The Spot Arm payload will provide the capability to perform near surface surveys for Alpha/Beta/Gamma radiation and to perform loose surface surveys
- Ultimately, custom software will allow Spot to combine these capabilities to track down radiation sources, find spills, and potentially clean them up

Container Inspection

- Using existing inspection payloads, the Spot robot can be used to remotely visually inspect containers for damage and visible corrosion
- Spot control is performed full remotely, keeping staff outside of radiation areas in accordance with ALARA goals
- Additional sensors can be added to provide detailed dimensional inspections and condition assessment
- Through further automation work, Spot could perform these inspections fully independently and report on non-standard findings to staff